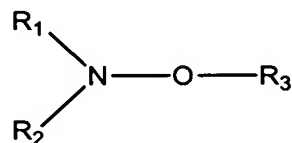


## THE CLAIMS

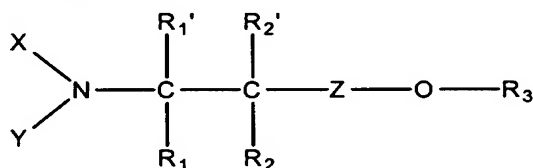
WHAT IS CLAIMED IS:

1. A substantially hydroxylamine-free composition comprising:  
from about 1 wt% to about 30 wt% of a hydroxylamine derivative having the  
formula



wherein  $R_1$ ,  $R_2$ , and  $R_3$  are independently a hydrogen atom, a hydroxyl group, a substituted  $C_1$ - $C_6$  straight, branched, or cyclic hydrocarbon group, a substituted acyl group, a straight or branched alkoxy, amidyl, carboxyl, alkoxyalkyl, alkylamino, alkylsulfonyl, or sulfonic acid group, or a salt of such compounds, and wherein at least one of  $R_1$ ,  $R_2$ , and  $R_3$  is not a hydrogen atom;

from about 20 wt% to about 80 wt% of a two-carbon atom linkage  
alkanolamine compound having the formula



wherein  $R_1$ ,  $R_1'$ ,  $R_2$ ,  $R_2'$ , and  $R_3$  are, independently in each case, hydrogen or a linear, branched, or cyclic hydrocarbon containing from 1 to 7 carbon atoms, wherein  $Z$  is a group having the formula  $-(Q-CR_1R_1'-CR_2R_2')_m-$ , such that  $m$  is a whole number from 0 to 3,  $R_1$ ,  $R_1'$ ,  $R_2$ , and  $R_2'$  are independently defined in each repeat unit, if  $m > 1$ , within the parameters set forth for these moieties above, and  $Q$  is independently defined in each repeat unit, if  $m > 1$ , each  $Q$  being independently either  $-O-$  or  $-NR_3-$ , and wherein  $X$  and  $Y$  are, independently in each case, hydrogen, a  $C_1$ - $C_7$  linear, branched, or cyclic hydrocarbon, or a group having the formula  $-CR_1R_1'-CR_2R_2'-Z-F$ , with  $F$  being either  $-O-R_3$  or  $-NR_3R_4$ , where  $R_4$  is defined similarly to  $R_1$ ,  $R_1'$ ,  $R_2$ ,  $R_2'$ , and  $R_3$  above, and with  $Z$ ,  $R_1$ ,  $R_1'$ ,  $R_2$ ,  $R_2'$ , and  $R_3$  defined as above, or wherein  $X$  and  $Y$  are linked together form a nitrogen-containing heterocyclic  $C_4$ - $C_7$  ring; and

from about 0.1 wt% to about 15 wt% of a corrosion inhibitor having single or multiple functionalities of one or more of the following: hydroxyl group, carboxylic acid, thiol group, amino group, alkoxy group, amidyl group, alkoxyalkyl group, alkylamino group, alkylsulfonyl group, sulfonic acid group, or a salt thereof,

26 wherein the composition is capable of removing residue from a metal or  
27 metal alloy substrate or a metal or metal alloy substrate layer, while maintaining an  
28 acceptably low etch rate with respect to the metal or metal alloy substrate or substrate layer.

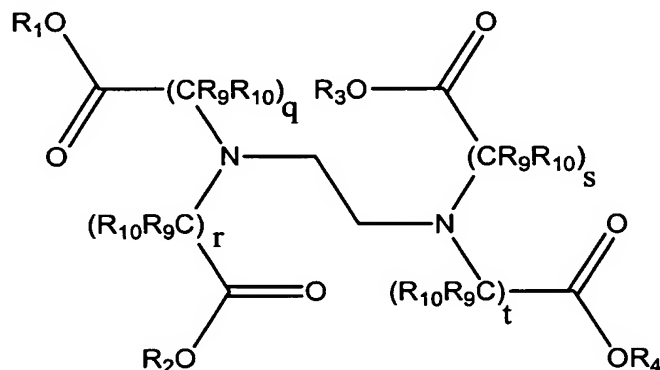
1 2. The substantially hydroxylamine-free composition of claim 1, further  
2 comprising water in an amount from about 5 wt% to about 40 wt%.

1 3. The substantially hydroxylamine-free composition of claim 1,  
2 wherein the composition is substantially free from water.

1 4. The substantially hydroxylamine-free composition of claim 1, further  
2 comprising a polar organic solvent in an amount from about 5 wt% to about 15 wt%.

1 5. The substantially hydroxylamine-free composition of claim 1,  
2 wherein the composition is substantially free from polar organic solvents.

1 6. The substantially hydroxylamine-free composition of claim 1,  
2 wherein the corrosion inhibitor comprises gallic acid, catechol, or an ethylenediamine  
3 tetracarboxylic acid compound having the formula



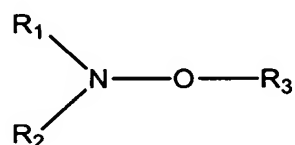
4 wherein  $\text{R}_1$ ,  $\text{R}_2$ ,  $\text{R}_3$  and  $\text{R}_4$  can be either H, or  $\text{NR}_5\text{R}_6\text{R}_7\text{R}_8$ , where  $\text{R}_5$ ,  $\text{R}_6$ ,  $\text{R}_7$ ,  
5 and  $\text{R}_8$  are each independently hydrogen or a linear or branched  $\text{C}_1\text{-C}_6$  hydrocarbon, or  
6 where two or more of  $\text{R}_5$ ,  $\text{R}_6$ ,  $\text{R}_7$ , and  $\text{R}_8$  together form a heterocyclic  $\text{C}_4\text{-C}_7$  ring, wherein  $\text{R}_9$   
7 and  $\text{R}_{10}$  may be independently defined in each repeat unit and each of which are  
8 independently hydrogen or a linear or branched  $\text{C}_1\text{-C}_6$  hydrocarbon, and wherein each of  $q$ ,  
9  $r$ ,  $s$ , and  $t$  is a whole number from 0 to 4.

1                   7.       The substantially hydroxylamine-free composition of claim 1,  
2 wherein the two-carbon atom linkage alkanolamine compound has a boiling point of at least  
3 about 185°C and a flash point of at least about 95°C.

1                   8.       The substantially hydroxylamine-free composition of claim 1,  
2 wherein more than one two-carbon atom linkage alkanolamine compound is present in the  
3 composition.

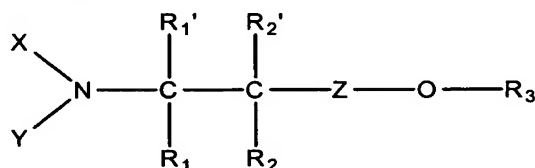
1                   9.       The substantially hydroxylamine-free composition of claim 1,  
2 wherein the hydroxylamine derivative comprises N,N-diethylhydroxylamine.

1                   10.      A substantially polar organic solvent-free composition comprising:  
2 from about 1 wt% to about 30 wt% of a hydroxylamine derivative having the  
3 formula



4 wherein  $R_1$ ,  $R_2$ , and  $R_3$  are independently a hydrogen atom, a hydroxyl group, a substituted  
5  $C_1$ - $C_6$  straight, branched, or cyclic hydrocarbon group, a substituted acyl group, a straight or  
6 branched alkoxy, amidyl, carboxyl, alkoxyalkyl, alkylamino, alkylsulfonyl, or sulfonic acid  
7 group, or a salt of such compounds, and wherein at least one of  $R_1$ ,  $R_2$ , and  $R_3$  is not a  
8 hydrogen atom;

9                   from about 20 wt% to about 80 wt% of a two-carbon atom linkage  
10 alkanolamine compound having the formula



11 wherein  $R_1$ ,  $R_1'$ ,  $R_2$ ,  $R_2'$ , and  $R_3$  are, independently in each case, hydrogen or a linear,  
12 branched, or cyclic hydrocarbon containing from 1 to 7 carbon atoms, wherein Z is a group  
13 having the formula  $-(Q-CR_1R_1'-CR_2R_2')_m-$ , such that m is a whole number from 0 to 3,  $R_1$ ,  
14  $R_1'$ ,  $R_2$ , and  $R_2'$  are independently defined in each repeat unit, if  $m > 1$ , within the parameters  
15 set forth for these moieties above, and Q is independently defined in each repeat unit, if  
16  $m > 1$ , each Q being independently either -O- or -NR<sub>3</sub>-, and wherein X and Y are,  
17 independently in each case, hydrogen, a  $C_1$ - $C_7$  linear, branched, or cyclic hydrocarbon, or a

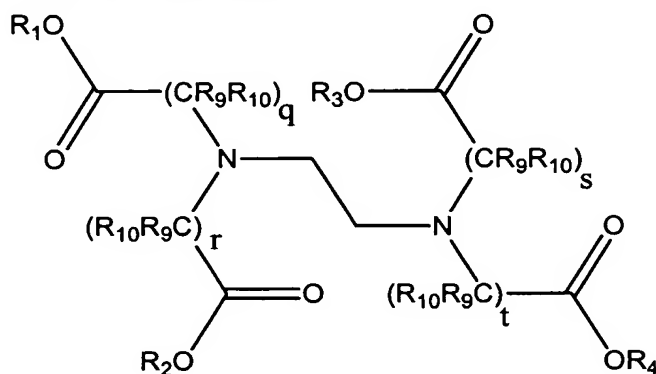
group having the formula  $-CR_1R_1'-CR_2R_2'-Z-F$ , with F being either  $-OR_3$  or  $-NR_3R_4$ , where  $R_4$  is defined similarly to  $R_1, R_1', R_2, R_2'$ , and  $R_3$  above, and with Z,  $R_1, R_1', R_2, R_2'$ , and  $R_3$  defined as above, or wherein X and Y are linked together form a nitrogen-containing heterocyclic  $C_4-C_7$  ring; and

from about 0.1 wt% to about 15 wt% of a corrosion inhibitor having single or multiple functionalities of one or more of the following: hydroxyl group, carboxylic acid, thiol group, amino group, alkoxy group, amidyl group, alkoxyalkyl group, alkylamino group, alkylsulfonyl group, sulfonic acid group, or a salt thereof,

wherein the composition is capable of removing residue from a metal or metal alloy substrate or a metal or metal alloy substrate layer, while maintaining an acceptably low etch rate with respect to the metal or metal alloy substrate or substrate layer.

11. The substantially polar organic solvent-free composition of claim 10, further comprising water in an amount from about 5 wt% to about 40 wt%.

12. The substantially polar organic solvent-free composition of claim 10, wherein the corrosion inhibitor comprises gallic acid, catechol, or an ethylenediamine tetracarboxylic acid compound having the formula



wherein  $R_1, R_2, R_3$  and  $R_4$  can be either H, or  $NR_5R_6R_7R_8$ , where  $R_5, R_6, R_7$ , and  $R_8$  are each independently hydrogen or a linear or branched  $C_1-C_6$  hydrocarbon, or where two or more of  $R_5, R_6, R_7$ , and  $R_8$  together form a heterocyclic  $C_4-C_7$  ring, wherein  $R_9$  and  $R_{10}$  may be independently defined in each repeat unit and each of which are independently hydrogen or a linear or branched  $C_1-C_6$  hydrocarbon, and wherein each of q, r, s, and t is a whole number from 0 to 4.

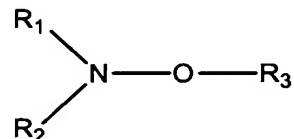
13. The substantially polar organic solvent-free composition of claim 10, wherein the two-carbon atom linkage alkanolamine compound has a boiling point of at least about 185°C and a flash point of at least about 95°C.

14. The substantially polar organic solvent-free composition of claim 13, wherein the two-carbon atom linkage alkanolamine compound comprises 2-(2-aminoethylamino)-ethanol, 2-(2-aminoethoxy)-ethanol, or both.

15. The substantially polar organic solvent-free composition of claim 10, wherein the hydroxylamine derivative comprises N,N-diethylhydroxylamine.

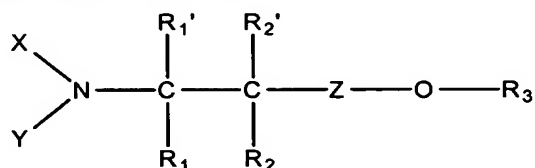
16. The substantially polar organic solvent-free composition of claim 10, further comprising hydroxylamine, wherein the ratio of hydroxylamine derivative to hydroxylamine is from about 20:1 to about 1:20, by weight.

17. A substantially polar organic solvent-free composition comprising: from about 1 wt% to about 30 wt% of a hydroxylamine derivative having the formula



wherein  $R_1$ ,  $R_2$ , and  $R_3$  are independently a hydrogen atom, a hydroxyl group, a substituted  $C_1$ - $C_6$  straight, branched, or cyclic hydrocarbon group, a substituted acyl group, a straight or branched alkoxy, amidyl, carboxyl, alkoxyalkyl, alkylamino, alkylsulfonyl, or sulfonic acid group, or a salt of such compounds, and wherein at least one of  $R_1$ ,  $R_2$ , and  $R_3$  is not a hydrogen atom;

from about 20 wt% to about 80 wt% of a two-carbon atom linkage alkanolamine compound having the formula



wherein  $R_1$ ,  $R_1'$ ,  $R_2$ ,  $R_2'$ , and  $R_3$  are, independently in each case, hydrogen or a linear, branched, or cyclic hydrocarbon containing from 1 to 7 carbon atoms, wherein  $Z$  is a group having the formula  $-(Q-CR_1R_1'-CR_2R_2')_m-$ , such that  $m$  is a whole number from 0 to 3,  $R_1$ ,

R<sub>1</sub>', R<sub>2</sub>, and R<sub>2</sub>' are independently defined in each repeat unit, if m>1, within the parameters set forth for these moieties above, and Q is independently defined in each repeat unit, if m>1, each Q being independently either -O- or -NR<sub>3</sub>-, and wherein X and Y are, independently in each case, hydrogen, a C<sub>1</sub>-C<sub>7</sub> linear, branched, or cyclic hydrocarbon, or a group having the formula -CR<sub>1</sub> R<sub>1</sub>'-CR<sub>2</sub> R<sub>2</sub>'-Z-F, with F being either -O-R<sub>3</sub> or -NR<sub>3</sub>R<sub>4</sub>, where R<sub>4</sub> is defined similarly to R<sub>1</sub>, R<sub>1</sub>', R<sub>2</sub>, R<sub>2</sub>', and R<sub>3</sub> above, and with Z, R<sub>1</sub>, R<sub>1</sub>', R<sub>2</sub>, R<sub>2</sub>', and R<sub>3</sub> defined as above, or wherein X and Y are linked together form a nitrogen-containing heterocyclic C<sub>4</sub>-C<sub>7</sub> ring; and

from about 5 wt% to about 45 wt% water,

wherein the composition is capable of removing residue from a metal or metal alloy substrate or a metal or metal alloy substrate layer, while maintaining an acceptably low etch rate with respect to the metal or metal alloy substrate or substrate layer.

18. The substantially polar organic solvent-free composition of claim 17, wherein the composition is substantially free from corrosion inhibitors.

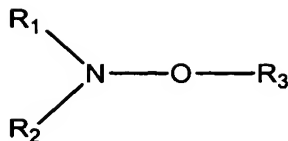
19. The substantially polar organic solvent-free composition of claim 17, wherein the two-carbon atom linkage alkanolamine compound has a boiling point of at least about 185°C and a flash point of at least about 95°C.

20. The substantially polar organic solvent-free composition of claim 19, wherein the two-carbon atom linkage alkanolamine compound comprises 2-(2-aminoethylamino)-ethanol, 2-(2-aminoethoxy)-ethanol, or both.

21. The substantially polar organic solvent-free composition of claim 17, wherein the hydroxylamine derivative comprises N,N-diethylhydroxylamine.

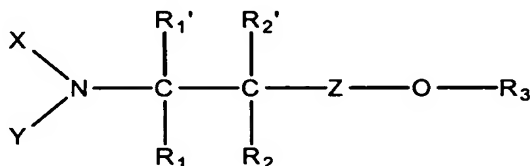
22. The substantially polar organic solvent-free composition of claim 17, further comprising hydroxylamine, wherein the ratio of hydroxylamine derivative to hydroxylamine is from about 20:1 to about 1:20, by weight.

23. A substantially hydroxylamine-free composition comprising:  
from about 1 wt% to about 30 wt% of a hydroxylamine derivative having the  
formula



wherein  $R_1$ ,  $R_2$ , and  $R_3$  are independently a hydrogen atom, a hydroxyl group, a substituted  $C_1$ - $C_6$  straight, branched, or cyclic hydrocarbon group, a substituted acyl group, a straight or branched alkoxy, amidyl, carboxyl, alkoxyalkyl, alkylamino, alkylsulfonyl, or sulfonic acid group, or a salt of such compounds, and wherein at least one of  $R_1$ ,  $R_2$ , and  $R_3$  is not a hydrogen atom;

from about 20 wt% to about 80 wt% of a two-carbon atom linkage  
alkanolamine compound having the formula



wherein  $R_1$ ,  $R_1'$ ,  $R_2$ ,  $R_2'$ , and  $R_3$  are, independently in each case, hydrogen or a linear, branched, or cyclic hydrocarbon containing from 1 to 7 carbon atoms, wherein  $Z$  is a group having the formula  $-(Q-CR_1R_1'-CR_2R_2')_m-$ , such that  $m$  is a whole number from 0 to 3,  $R_1$ ,  $R_1'$ ,  $R_2$ , and  $R_2'$  are independently defined in each repeat unit, if  $m > 1$ , within the parameters set forth for these moieties above, and  $Q$  is independently defined in each repeat unit, if  $m > 1$ , each  $Q$  being independently either  $-O-$  or  $-NR_3-$ , and wherein  $X$  and  $Y$  are, independently in each case, hydrogen, a  $C_1$ - $C_7$  linear, branched, or cyclic hydrocarbon, or a group having the formula  $-CR_1R_1'-CR_2R_2'-Z-F$ , with  $F$  being either  $-O-R_3$  or  $-NR_3R_4$ , where  $R_4$  is defined similarly to  $R_1$ ,  $R_1'$ ,  $R_2$ ,  $R_2'$ , and  $R_3$  above, and with  $Z$ ,  $R_1$ ,  $R_1'$ ,  $R_2$ ,  $R_2'$ , and  $R_3$  defined as above, or wherein  $X$  and  $Y$  are linked together form a nitrogen-containing heterocyclic  $C_4$ - $C_7$  ring; and

from about 5 wt% to about 45 wt% water,  
wherein the composition is capable of removing residue from a metal or metal alloy substrate or a metal or metal alloy substrate layer, while maintaining an acceptably low etch rate with respect to the metal or metal alloy substrate or substrate layer.

24. The substantially hydroxylamine-free composition of claim 23,  
wherein the composition is substantially free from corrosion inhibitors.

1                    25.    The substantially hydroxylamine-free composition of claim 23,  
2 wherein the two-carbon atom linkage alkanolamine compound has a boiling point of at least  
3 about 185°C and a flash point of at least about 95°C.

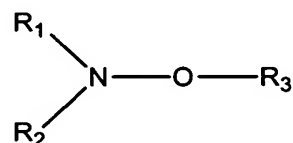
1                    26.    The substantially hydroxylamine-free composition of claim 25,  
2 wherein the two-carbon atom linkage alkanolamine compound comprises 2-(2-  
3 aminoethylamino)-ethanol, 2-(2-aminoethoxy)-ethanol, or both.

1                    27.    The substantially hydroxylamine-free composition of claim 23,  
2 wherein the hydroxylamine derivative comprises N,N-diethylhydroxylamine.

1                    28.    The substantially hydroxylamine-free composition of claim 23,  
2 further comprising a polar organic solvent in an amount from about 5 wt% to about 15 wt%.

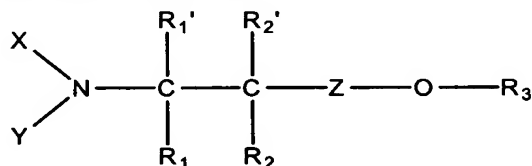
1                    29.    The substantially hydroxylamine-free composition of claim 23,  
2 wherein the composition is substantially free from polar organic solvents.

1                    30.    A substantially water-free composition comprising:  
2 from about 5 wt% to about 30 wt% of a hydroxylamine derivative having the  
3 formula



4 wherein  $R_1$ ,  $R_2$ , and  $R_3$  are independently a hydrogen atom, a hydroxyl group, a substituted  
5  $C_1$ - $C_6$  straight, branched, or cyclic hydrocarbon group, a substituted acyl group, a straight or  
6 branched alkoxy, amidyl, carboxyl, alkoxyalkyl, alkylamino, alkylsulfonyl, or sulfonic acid  
7 group, or a salt of such compounds, and wherein at least one of  $R_1$ ,  $R_2$ , and  $R_3$  is not a  
8 hydrogen atom; and

9                    from about 20 wt% to about 80 wt% of a two-carbon atom linkage  
10 alkanolamine compound having the formula

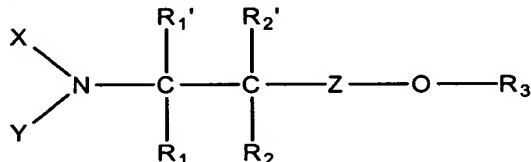




wherein  $R_1$ ,  $R_1'$ ,  $R_2$ ,  $R_2'$ , and  $R_3$  are, independently in each case, hydrogen or a linear, branched, or cyclic hydrocarbon containing from 1 to 7 carbon atoms, wherein Z is a group having the formula  $-(Q-CR_1R_1'-CR_2R_2')_m-$ , such that m is a whole number from 0 to 3,  $R_1$ ,  $R_1'$ ,  $R_2$ , and  $R_2'$  are independently defined in each repeat unit, if  $m > 1$ , within the parameters set forth for these moieties above, and Q is independently defined in each repeat unit, if  $m > 1$ , each Q being independently either -O- or -NR<sub>3</sub>-, and wherein X and Y are, independently in each case, hydrogen, a C<sub>1</sub>-C<sub>7</sub> linear, branched, or cyclic hydrocarbon, or a group having the formula -CR<sub>1</sub>R<sub>1'</sub>-CR<sub>2</sub>R<sub>2'</sub>-Z-F, with F being either -O-R<sub>3</sub> or -NR<sub>3</sub>R<sub>4</sub>, where R<sub>4</sub> is defined similarly to  $R_1$ ,  $R_1'$ ,  $R_2$ ,  $R_2'$ , and  $R_3$  above, and with Z,  $R_1$ ,  $R_1'$ ,  $R_2$ ,  $R_2'$ , and  $R_3$  defined as above, or wherein X and Y are linked together form a nitrogen-containing heterocyclic C<sub>4</sub>-C<sub>7</sub> ring,

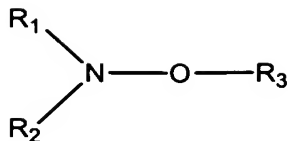
wherein the composition is capable of removing residue from a metal or metal alloy substrate or a metal or metal alloy substrate layer, while maintaining an acceptably low etch rate with respect to the metal or metal alloy substrate or substrate layer.

31. A composition consisting essentially of:  
at least about 40% by weight of a two-carbon atom linkage alkanolamine compound having the formula



wherein  $R_1$ ,  $R_1'$ ,  $R_2$ ,  $R_2'$ , and  $R_3$  are, independently in each case, hydrogen or a linear, branched, or cyclic hydrocarbon containing from 1 to 7 carbon atoms, wherein Z is a group having the formula  $-(Q-CR_1R_1'-CR_2R_2')_m-$ , such that m is a whole number from 0 to 3,  $R_1$ ,  $R_1'$ ,  $R_2$ , and  $R_2'$  are independently defined in each repeat unit, if  $m > 1$ , within the parameters set forth for these moieties above, and Q is independently defined in each repeat unit, if  $m > 1$ , each Q being independently either -O- or -NR<sub>3</sub>-, and wherein X and Y are, independently in each case, hydrogen, a C<sub>1</sub>-C<sub>7</sub> linear, branched, or cyclic hydrocarbon, or a group having the formula -CR<sub>1</sub>R<sub>1'</sub>-CR<sub>2</sub>R<sub>2'</sub>-Z-F, with F being either -O-R<sub>3</sub> or -NR<sub>3</sub>R<sub>4</sub>, where R<sub>4</sub> is defined similarly to  $R_1$ ,  $R_1'$ ,  $R_2$ ,  $R_2'$ , and  $R_3$  above, and with Z,  $R_1$ ,  $R_1'$ ,  $R_2$ ,  $R_2'$ , and  $R_3$  defined as above, or wherein X and Y are linked together form a nitrogen-containing heterocyclic C<sub>4</sub>-C<sub>7</sub> ring;

from about 1% to about 30% by weight of a hydroxylamine derivative having the formula



wherein  $\text{R}_1$ ,  $\text{R}_2$ , and  $\text{R}_3$  are independently a hydrogen atom, a hydroxyl group, a substituted  $\text{C}_1$ - $\text{C}_6$  straight, branched, or cyclic hydrocarbon group, a substituted acyl group, a straight or branched alkoxy, amidyl, carboxyl, alkoxyalkyl, alkylamino, alkylsulfonyl, or sulfonic acid group, or a salt of such compounds, and wherein at least one of  $\text{R}_1$ ,  $\text{R}_2$ , and  $\text{R}_3$  is not a hydrogen atom;

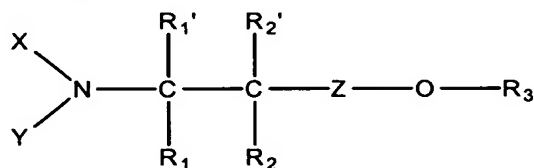
from about 0.1% to about 15% by weight of a corrosion inhibitor having single or multiple functionalities of one or more of the following: hydroxyl group, carboxylic acid, thiol group, amino group, alkoxy group, amidyl group, alkoxyalkyl group, alkylamino group, alkylsulfonyl group, sulfonic acid group, or a salt thereof; and

from 0% to about 50% by weight of water,

wherein the composition is capable of removing residue from a titanium or titanium alloy substrate or a titanium or titanium alloy substrate layer, while maintaining an acceptably low etch rate with respect to the titanium or titanium alloy substrate or substrate layer.

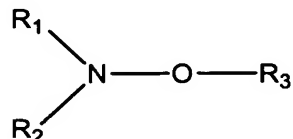
32. A composition consisting essentially of:

from about 20% to about 80% by weight of a two-carbon atom linkage alkanolamine compound having the formula



wherein  $\text{R}_1$ ,  $\text{R}_1'$ ,  $\text{R}_2$ ,  $\text{R}_2'$ , and  $\text{R}_3$  are, independently in each case, hydrogen or a linear, branched, or cyclic hydrocarbon containing from 1 to 7 carbon atoms, wherein  $\text{Z}$  is a group having the formula  $-(\text{Q}-\text{CR}_1\text{R}_1'-\text{CR}_2\text{R}_2')_m-$ , such that  $m$  is a whole number from 0 to 3,  $\text{R}_1$ ,  $\text{R}_1'$ ,  $\text{R}_2$ , and  $\text{R}_2'$  are independently defined in each repeat unit, if  $m > 1$ , within the parameters set forth for these moieties above, and  $\text{Q}$  is independently defined in each repeat unit, if  $m > 1$ , each  $\text{Q}$  being independently either  $-\text{O}-$  or  $-\text{NR}_3-$ , and wherein  $\text{X}$  and  $\text{Y}$  are, independently in each case, hydrogen, a  $\text{C}_1$ - $\text{C}_7$  linear, branched, or cyclic hydrocarbon, or a group having the formula  $-\text{CR}_1\text{R}_1'-\text{CR}_2\text{R}_2'-\text{Z}-\text{F}$ , with  $\text{F}$  being either  $-\text{O}-\text{R}_3$  or  $-\text{NR}_3\text{R}_4$ , where  $\text{R}_4$  is defined similarly to  $\text{R}_1$ ,  $\text{R}_1'$ ,  $\text{R}_2$ ,  $\text{R}_2'$ , and  $\text{R}_3$  above, and with  $\text{Z}$ ,  $\text{R}_1$ ,  $\text{R}_1'$ ,  $\text{R}_2$ ,  $\text{R}_2'$ , and  $\text{R}_3$

defined as above, or wherein X and Y are linked together form a nitrogen-containing heterocyclic C<sub>4</sub>-C<sub>7</sub> ring;  
 from about 1% to about 19% by weight of a hydroxylamine derivative having the formula

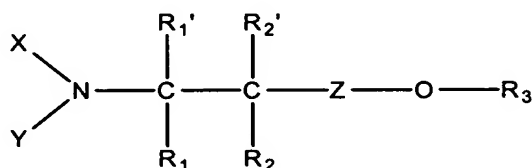


wherein R<sub>1</sub>, R<sub>2</sub>, and R<sub>3</sub> are independently a hydrogen atom, a hydroxyl group, a substituted C<sub>1</sub>-C<sub>6</sub> straight, branched, or cyclic hydrocarbon group, a substituted acyl group, a straight or branched alkoxy, amidyl, carboxyl, alkoxyalkyl, alkylamino, alkylsulfonyl, or sulfonic acid group, or a salt of such compounds, and wherein at least one of R<sub>1</sub>, R<sub>2</sub>, and R<sub>3</sub> is not a hydrogen atom;

from about 0.1% to about 15% by weight of a corrosion inhibitor having single or multiple functionalities of one or more of the following: hydroxyl group, carboxylic acid, thiol group, amino group, alkoxy group, amidyl group, alkoxyalkyl group, alkylamino group, alkylsulfonyl group, sulfonic acid group, or a salt thereof; and

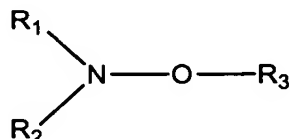
from about 0% to about 39% by weight of water,  
 wherein the composition is capable of removing residue from a titanium or titanium alloy substrate or a titanium or titanium alloy substrate layer, while maintaining an acceptably low etch rate with respect to the titanium or titanium alloy substrate or substrate layer.

33. A composition consisting essentially of:  
 not more than 51.0% by weight of a two-carbon atom linkage alkanolamine compound having the formula



wherein R<sub>1</sub>, R<sub>1</sub>', R<sub>2</sub>, R<sub>2</sub>', and R<sub>3</sub> are, independently in each case, hydrogen or a linear, branched, or cyclic hydrocarbon containing from 1 to 7 carbon atoms, wherein Z is a group having the formula  $-(\text{Q}-\text{CR}_1\text{R}_1'-\text{CR}_2\text{R}_2')_m-$ , such that m is a whole number from 0 to 3, R<sub>1</sub>, R<sub>1</sub>', R<sub>2</sub>, and R<sub>2</sub>' are independently defined in each repeat unit, if m>1, within the parameters set forth for these moieties above, and Q is independently defined in each repeat unit, if m>1, each Q being independently either -O- or -NR<sub>3</sub>-, and wherein X and Y are,

independently in each case, hydrogen, a C<sub>1</sub>-C<sub>7</sub> linear, branched, or cyclic hydrocarbon, or a group having the formula -CR<sub>1</sub>R<sub>1</sub>'-CR<sub>2</sub>R<sub>2</sub>'-Z-F, with F being either -O-R<sub>3</sub> or -NR<sub>3</sub>R<sub>4</sub>, where R<sub>4</sub> is defined similarly to R<sub>1</sub>, R<sub>1</sub>', R<sub>2</sub>, R<sub>2</sub>', and R<sub>3</sub> above, and with Z, R<sub>1</sub>, R<sub>1</sub>', R<sub>2</sub>, R<sub>2</sub>', and R<sub>3</sub> defined as above, or wherein X and Y are linked together form a nitrogen-containing heterocyclic C<sub>4</sub>-C<sub>7</sub> ring;  
 from about 1% to about 30% by weight of a hydroxylamine derivative having the formula



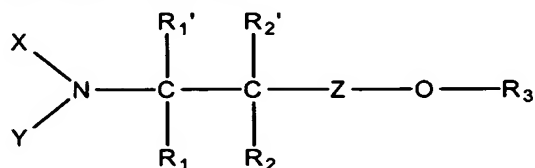
wherein R<sub>1</sub>, R<sub>2</sub>, and R<sub>3</sub> are independently a hydrogen atom, a hydroxyl group, a substituted C<sub>1</sub>-C<sub>6</sub> straight, branched, or cyclic hydrocarbon group, a substituted acyl group, a straight or branched alkoxy, amidyl, carboxyl, alkoxyalkyl, alkylamino, alkylsulfonyl, or sulfonic acid group, or a salt of such compounds, and wherein at least one of R<sub>1</sub>, R<sub>2</sub>, and R<sub>3</sub> is not a hydrogen atom;

from about 0.1% to about 15% by weight of a corrosion inhibitor having single or multiple functionalities of one or more of the following: hydroxyl group, carboxylic acid, thiol group, amino group, alkoxy group, amidyl group, alkoxyalkyl group, alkylamino group, alkylsulfonyl group, sulfonic acid group, or a salt thereof; and

from about 0% to about 50% by weight of water,

wherein the composition is capable of removing residue from a copper or copper alloy substrate or a copper or copper alloy substrate layer, while maintaining an acceptably low etch rate with respect to the copper or copper alloy substrate or substrate layer.

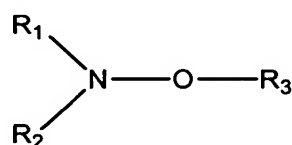
34. A composition consisting essentially of:  
 from about 20% to about 80% by weight of a two-carbon atom linkage alkanolamine compound having the formula



wherein R<sub>1</sub>, R<sub>1</sub>', R<sub>2</sub>, R<sub>2</sub>', and R<sub>3</sub> are, independently in each case, hydrogen or a linear, branched, or cyclic hydrocarbon containing from 1 to 7 carbon atoms, wherein Z is a group having the formula -(Q-CR<sub>1</sub>R<sub>1</sub>'-CR<sub>2</sub>R<sub>2</sub>'-)<sub>m</sub>-, such that m is a whole number from 0 to 3, R<sub>1</sub>,

$R_1'$ ,  $R_2$ , and  $R_2'$  are independently defined in each repeat unit, if  $m > 1$ , within the parameters set forth for these moieties above, and  $Q$  is independently defined in each repeat unit, if  $m > 1$ , each  $Q$  being independently either  $-O-$  or  $-NR_3-$ , and wherein  $X$  and  $Y$  are, independently in each case, hydrogen, a  $C_1$ - $C_7$  linear, branched, or cyclic hydrocarbon, or a group having the formula  $-CR_1 R_1'-CR_2 R_2'-Z-F$ , with  $F$  being either  $-O-R_3$  or  $-NR_3 R_4$ , where  $R_4$  is defined similarly to  $R_1$ ,  $R_1'$ ,  $R_2$ ,  $R_2'$ , and  $R_3$  above, and with  $Z$ ,  $R_1$ ,  $R_1'$ ,  $R_2$ ,  $R_2'$ , and  $R_3$  defined as above, or wherein  $X$  and  $Y$  are linked together form a nitrogen-containing heterocyclic  $C_4$ - $C_7$  ring;

from about 1% to about 30% by weight of a hydroxylamine derivative having the formula



wherein  $R_1$ ,  $R_2$ , and  $R_3$  are independently a hydrogen atom, a hydroxyl group, a substituted  $C_1$ - $C_6$  straight, branched, or cyclic hydrocarbon group, a substituted acyl group, a straight or branched alkoxy, amidyl, carboxyl, alkoxyalkyl, alkylamino, alkylsulfonyl, or sulfonic acid group, or a salt of such compounds, and wherein at least one of  $R_1$ ,  $R_2$ , and  $R_3$  is not a hydrogen atom;

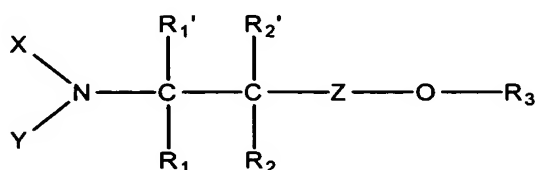
from about 6% to about 15% by weight of a corrosion inhibitor having single or multiple functionalities of one or more of the following: hydroxyl group, carboxylic acid, thiol group, amino group, alkoxy group, amidyl group, alkoxyalkyl group, alkylamino group, alkylsulfonyl group, sulfonic acid group, or a salt thereof; and

from about 0% to about 50% by weight of water,

wherein the composition is capable of removing residue from a copper or copper alloy substrate or a copper or copper alloy substrate layer, while maintaining an acceptably low etch rate with respect to the copper or copper alloy substrate or substrate layer.

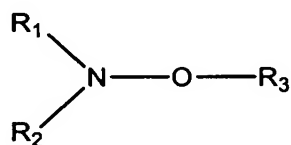
35. A composition consisting essentially of:

from about 20% to about 80% by weight of a two-carbon atom linkage alkanolamine compound having the formula



wherein  $R_1$ ,  $R_1'$ ,  $R_2$ ,  $R_2'$ , and  $R_3$  are, independently in each case, hydrogen or a linear, branched, or cyclic hydrocarbon containing from 1 to 7 carbon atoms, wherein Z is a group having the formula  $(-Q-CR_1R_1'-CR_2R_2')_m$ , such that m is a whole number from 0 to 3,  $R_1$ ,  $R_1'$ ,  $R_2$ , and  $R_2'$  are independently defined in each repeat unit, if  $m > 1$ , within the parameters set forth for these moieties above, and Q is independently defined in each repeat unit, if  $m > 1$ , each Q being independently either -O- or -NR<sub>3</sub>-, and wherein X and Y are, independently in each case, hydrogen, a C<sub>1</sub>-C<sub>7</sub> linear, branched, or cyclic hydrocarbon, or a group having the formula -CR<sub>1</sub>R<sub>1'</sub>-CR<sub>2</sub>R<sub>2'</sub>-Z-F, with F being either -O-R<sub>3</sub> or -NR<sub>3</sub>R<sub>4</sub>, where R<sub>4</sub> is defined similarly to  $R_1$ ,  $R_1'$ ,  $R_2$ ,  $R_2'$ , and  $R_3$  above, and with Z,  $R_1$ ,  $R_1'$ ,  $R_2$ ,  $R_2'$ , and  $R_3$  defined as above, or wherein X and Y are linked together form a nitrogen-containing heterocyclic C<sub>4</sub>-C<sub>7</sub> ring;

from about 1% to about 15% by weight of a hydroxylamine derivative having the formula



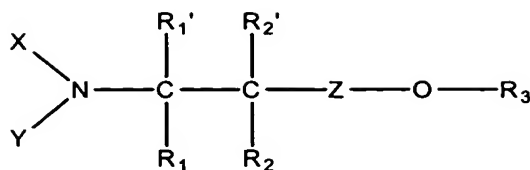
wherein  $R_1$ ,  $R_2$ , and  $R_3$  are independently a hydrogen atom, a hydroxyl group, a substituted C<sub>1</sub>-C<sub>6</sub> straight, branched, or cyclic hydrocarbon group, a substituted acyl group, a straight or branched alkoxy, amidyl, carboxyl, alkoxyalkyl, alkylamino, alkylsulfonyl, or sulfonic acid group, or a salt of such compounds, and wherein at least one of  $R_1$ ,  $R_2$ , and  $R_3$  is not a hydrogen atom;

less than 5% by weight of a corrosion inhibitor having single or multiple functionalities of one or more of the following: hydroxyl group, carboxylic acid, thiol group, amino group, alkoxy group, amidyl group, alkoxyalkyl group, alkylamino group, alkylsulfonyl group, sulfonic acid group, or a salt thereof; and

from about 0% to about 31% by weight of water,

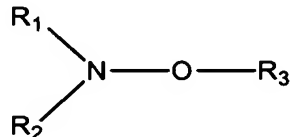
wherein the composition is capable of removing residue from a copper or copper alloy substrate or a copper or copper alloy substrate layer, while maintaining an acceptably low etch rate with respect to the copper or copper alloy substrate or substrate layer.

36. A composition consisting essentially of:  
from about 20% to about 80% by weight of a two-carbon atom linkage  
alkanolamine compound having the formula



wherein  $\text{R}_1$ ,  $\text{R}_1'$ ,  $\text{R}_2$ ,  $\text{R}_2'$ , and  $\text{R}_3$  are, independently in each case, hydrogen or a linear, branched, or cyclic hydrocarbon containing from 1 to 7 carbon atoms, wherein Z is a group having the formula  $-(\text{Q}-\text{CR}_1\text{R}_1'-\text{CR}_2\text{R}_2')_m-$ , such that m is a whole number from 0 to 3,  $\text{R}_1$ ,  $\text{R}_1'$ ,  $\text{R}_2$ , and  $\text{R}_2'$  are independently defined in each repeat unit, if  $m > 1$ , within the parameters set forth for these moieties above, and Q is independently defined in each repeat unit, if  $m > 1$ , each Q being independently either -O- or -NR<sub>3</sub>-, and wherein X and Y are, independently in each case, hydrogen, a C<sub>1</sub>-C<sub>7</sub> linear, branched, or cyclic hydrocarbon, or a group having the formula -CR<sub>1</sub> R<sub>1</sub>'-CR<sub>2</sub> R<sub>2</sub>'-Z-F, with F being either -O-R<sub>3</sub> or -NR<sub>3</sub>R<sub>4</sub>, where R<sub>4</sub> is defined similarly to  $\text{R}_1$ ,  $\text{R}_1'$ ,  $\text{R}_2$ ,  $\text{R}_2'$ , and  $\text{R}_3$  above, and with Z,  $\text{R}_1$ ,  $\text{R}_1'$ ,  $\text{R}_2$ ,  $\text{R}_2'$ , and  $\text{R}_3$  defined as above, or wherein X and Y are linked together form a nitrogen-containing heterocyclic C<sub>4</sub>-C<sub>7</sub> ring;

greater than about 15% by weight of a hydroxylamine derivative having the formula

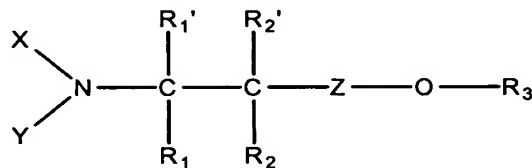


wherein  $\text{R}_1$ ,  $\text{R}_2$ , and  $\text{R}_3$  are independently a hydrogen atom, a hydroxyl group, a substituted C<sub>1</sub>-C<sub>6</sub> straight, branched, or cyclic hydrocarbon group, a substituted acyl group, a straight or branched alkoxy, amidyl, carboxyl, alkoxyalkyl, alkylamino, alkylsulfonyl, or sulfonic acid group, or a salt of such compounds, and wherein at least one of  $\text{R}_1$ ,  $\text{R}_2$ , and  $\text{R}_3$  is not a hydrogen atom;

from about 0.1% to about 15% by weight of a corrosion inhibitor having single or multiple functionalities of one or more of the following: hydroxyl group, carboxylic acid, thiol group, amino group, alkoxy group, amidyl group, alkoxyalkyl group, alkylamino group, alkylsulfonyl group, sulfonic acid group, or a salt thereof; and

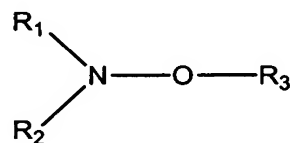
greater than 25% by weight of water, wherein the composition is capable of removing residue from a copper or copper alloy substrate or a copper or copper alloy substrate layer, while maintaining an acceptably low etch rate with respect to the copper or copper alloy substrate or substrate layer.

37. A composition consisting essentially of:  
 not less than 50.0% by weight of a two-carbon atom linkage alkanolamine  
 compound having the formula



wherein  $\text{R}_1$ ,  $\text{R}_1'$ ,  $\text{R}_2$ ,  $\text{R}_2'$ , and  $\text{R}_3$  are, independently in each case, hydrogen or a linear, branched, or cyclic hydrocarbon containing from 1 to 7 carbon atoms, wherein Z is a group having the formula  $(-\text{Q}-\text{CR}_1\text{R}_1'-\text{CR}_2\text{R}_2'-)_m$ , such that m is a whole number from 0 to 3,  $\text{R}_1$ ,  $\text{R}_1'$ ,  $\text{R}_2$ , and  $\text{R}_2'$  are independently defined in each repeat unit, if  $m > 1$ , within the parameters set forth for these moieties above, and Q is independently defined in each repeat unit, if  $m > 1$ , each Q being independently either -O- or -NR<sub>3</sub>-, and wherein X and Y are, independently in each case, hydrogen, a C<sub>1</sub>-C<sub>7</sub> linear, branched, or cyclic hydrocarbon, or a group having the formula -CR<sub>1</sub>R<sub>1'</sub>-CR<sub>2</sub>R<sub>2'</sub>-Z-F, with F being either -O-R<sub>3</sub> or -NR<sub>3</sub>R<sub>4</sub>, where R<sub>4</sub> is defined similarly to  $\text{R}_1$ ,  $\text{R}_1'$ ,  $\text{R}_2$ ,  $\text{R}_2'$ , and  $\text{R}_3$  above, and with Z,  $\text{R}_1$ ,  $\text{R}_1'$ ,  $\text{R}_2$ ,  $\text{R}_2'$ , and  $\text{R}_3$  defined as above, or wherein X and Y are linked together form a nitrogen-containing heterocyclic C<sub>4</sub>-C<sub>7</sub> ring;

greater than about 11% by weight of a hydroxylamine derivative having the formula



wherein  $\text{R}_1$ ,  $\text{R}_2$ , and  $\text{R}_3$  are independently a hydrogen atom, a hydroxyl group, a substituted C<sub>1</sub>-C<sub>6</sub> straight, branched, or cyclic hydrocarbon group, a substituted acyl group, a straight or branched alkoxy, amidyl, carboxyl, alkoxyalkyl, alkylamino, alkylsulfonyl, or sulfonic acid group, or a salt of such compounds, and wherein at least one of  $\text{R}_1$ ,  $\text{R}_2$ , and  $\text{R}_3$  is not a hydrogen atom;

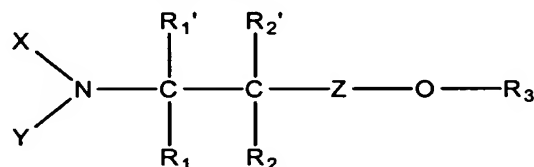
from about 0.1% to about 15% by weight of a corrosion inhibitor having single or multiple functionalities of one or more of the following: hydroxyl group, carboxylic acid, thiol group, amino group, alkoxy group, amidyl group, alkoxyalkyl group, alkylamino group, alkylsulfonyl group, sulfonic acid group, or a salt thereof; and

from about 0% to about 50% by weight of water,



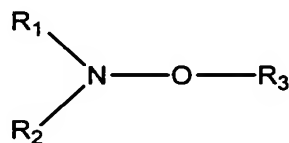
wherein the composition is capable of removing residue from an aluminum or aluminum alloy substrate or a copper or copper alloy substrate layer, while maintaining an acceptably low etch rate with respect to the aluminum or aluminum alloy substrate or substrate layer.

38. A composition consisting essentially of:  
from about 20% to about 80% by weight of a two-carbon atom linkage alkanolamine compound having the formula



wherein  $\text{R}_1$ ,  $\text{R}_1'$ ,  $\text{R}_2$ ,  $\text{R}_2'$ , and  $\text{R}_3$  are, independently in each case, hydrogen or a linear, branched, or cyclic hydrocarbon containing from 1 to 7 carbon atoms, wherein Z is a group having the formula  $(-\text{Q}-\text{CR}_1\text{R}_1'-\text{CR}_2\text{R}_2'-)_m$ , such that m is a whole number from 0 to 3,  $\text{R}_1$ ,  $\text{R}_1'$ ,  $\text{R}_2$ , and  $\text{R}_2'$  are independently defined in each repeat unit, if  $m > 1$ , within the parameters set forth for these moieties above, and Q is independently defined in each repeat unit, if  $m > 1$ , each Q being independently either -O- or -NR<sub>3</sub>-, and wherein X and Y are, independently in each case, hydrogen, a C<sub>1</sub>-C<sub>7</sub> linear, branched, or cyclic hydrocarbon, or a group having the formula -CR<sub>1</sub>R<sub>1'</sub>-CR<sub>2</sub>R<sub>2'</sub>-Z-F, with F being either -O-R<sub>3</sub> or -NR<sub>3</sub>R<sub>4</sub>, where R<sub>4</sub> is defined similarly to  $\text{R}_1$ ,  $\text{R}_1'$ ,  $\text{R}_2$ ,  $\text{R}_2'$ , and  $\text{R}_3$  above, and with Z,  $\text{R}_1$ ,  $\text{R}_1'$ ,  $\text{R}_2$ ,  $\text{R}_2'$ , and  $\text{R}_3$  defined as above, or wherein X and Y are linked together form a nitrogen-containing heterocyclic C<sub>4</sub>-C<sub>7</sub> ring;

from about 1% to about 30% by weight of a hydroxylamine derivative having the formula

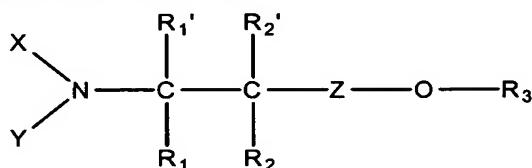


wherein  $\text{R}_1$ ,  $\text{R}_2$ , and  $\text{R}_3$  are independently a hydrogen atom, a hydroxyl group, a substituted C<sub>1</sub>-C<sub>6</sub> straight, branched, or cyclic hydrocarbon group, a substituted acyl group, a straight or branched alkoxy, amidyl, carboxyl, alkoxyalkyl, alkylamino, alkylsulfonyl, or sulfonic acid group, or a salt of such compounds, and wherein at least one of  $\text{R}_1$ ,  $\text{R}_2$ , and  $\text{R}_3$  is not a hydrogen atom;

from about 0.1% to about 15% by weight of a corrosion inhibitor having single or multiple functionalities of one or more of the following: hydroxyl group,

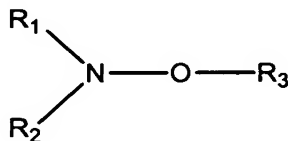
carboxylic acid, thiol group, amino group, alkoxy group, amidyl group, alkoxyalkyl group, alkylamino group, alkylsulfonyl group, sulfonic acid group, or a salt thereof; and less than about 30% by weight of water, wherein the composition is capable of removing residue from an aluminum or aluminum alloy substrate or a copper or copper alloy substrate layer, while maintaining an acceptably low etch rate with respect to the aluminum or aluminum alloy substrate or substrate layer.

39. A composition consisting essentially of: from about 20% to about 80% by weight of a two-carbon atom linkage alkanolamine compound having the formula



wherein  $\text{R}_1$ ,  $\text{R}_1'$ ,  $\text{R}_2$ ,  $\text{R}_2'$ , and  $\text{R}_3$  are, independently in each case, hydrogen or a linear, branched, or cyclic hydrocarbon containing from 1 to 7 carbon atoms, wherein Z is a group having the formula  $-(\text{Q}-\text{CR}_1\text{R}_1'-\text{CR}_2\text{R}_2')_m-$ , such that m is a whole number from 0 to 3,  $\text{R}_1$ ,  $\text{R}_1'$ ,  $\text{R}_2$ , and  $\text{R}_2'$  are independently defined in each repeat unit, if  $m > 1$ , within the parameters set forth for these moieties above, and Q is independently defined in each repeat unit, if  $m > 1$ , each Q being independently either -O- or - $\text{NR}_3$ -, and wherein X and Y are, independently in each case, hydrogen, a  $\text{C}_1$ - $\text{C}_7$  linear, branched, or cyclic hydrocarbon, or a group having the formula  $-\text{CR}_1\text{R}_1'-\text{CR}_2\text{R}_2'-\text{Z}-\text{F}$ , with F being either -O- $\text{R}_3$  or - $\text{NR}_3\text{R}_4$ , where  $\text{R}_4$  is defined similarly to  $\text{R}_1$ ,  $\text{R}_1'$ ,  $\text{R}_2$ ,  $\text{R}_2'$ , and  $\text{R}_3$  above, and with Z,  $\text{R}_1$ ,  $\text{R}_1'$ ,  $\text{R}_2$ ,  $\text{R}_2'$ , and  $\text{R}_3$  defined as above, or wherein X and Y are linked together form a nitrogen-containing heterocyclic  $\text{C}_4$ - $\text{C}_7$  ring;

from about 11% to about 18% by weight of a hydroxylamine derivative having the formula



wherein  $\text{R}_1$ ,  $\text{R}_2$ , and  $\text{R}_3$  are independently a hydrogen atom, a hydroxyl group, a substituted  $\text{C}_1$ - $\text{C}_6$  straight, branched, or cyclic hydrocarbon group, a substituted acyl group, a straight or branched alkoxy, amidyl, carboxyl, alkoxyalkyl, alkylamino, alkylsulfonyl, or sulfonic acid

group, or a salt of such compounds, and wherein at least one of  $R_1$ ,  $R_2$ , and  $R_3$  is not a hydrogen atom;

from about 0.5% to about 7% by weight of a corrosion inhibitor having single or multiple functionalities of one or more of the following: hydroxyl group, carboxylic acid, thiol group, amino group, alkoxy group, amidyl group, alkoxyalkyl group, alkylamino group, alkylsulfonyl group, sulfonic acid group, or a salt thereof; and

less than 35% by weight of water,

wherein the composition is capable of removing residue from an aluminum or aluminum alloy substrate or a copper or copper alloy substrate layer, while maintaining an acceptably low etch rate with respect to the aluminum or aluminum alloy substrate or substrate layer.